29-OCT-09 GEORGIA DEPARTMENT OF TRANSPORTATION PROB. NO. 0001
08:49:33 PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
38' CURB-CURB; 5 BEAMS; 110' SPAN; 50' TALL; BRIDGE 25 ; PIER 27

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW ANG D M S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* MAIN SIZE	* STR SIZ	* MAX TOP	CAP REINFORCING STEEL MAX BOT	MIN SIZE	* MIN NO.	* TOP CL.	* MIN S.SP	CAP DEPTH INCR.	BOT CL.
D D D L	2	1	12	0-00-00	3500.	1400.	8.	60000.	24000.	3409.	29000.	0.0030	170.	11	5	16	16	11	2	2.00	4.00	3.00	2.00

COLUMN REINFORCING STEEL MIN.P	MAX.P	CL.SP.	CLEAR	R MODE	KL COEF	OC	OF	CM	BD1	BD2	IMPACT %	SOIL WT KCF	ALL.S.P. KSF	MIN PL SP	MAX PL SP	EDGE DIST	PILE DEPTH	REBAR CLEAR	ALL.PILE CAPACITY	ALL.PILE UPLIFT	I P
1.00	8.00	2.50	3.750	2	2.00	0.70	0.90	1.00	1.00	0.75	21.28	0.120	0.000	3.00	9.00	1.250	1.000	3.000	235.000	-9.999	

CAP DATA

CN	C	L	A	DE	BC	BE	DH	LH	XB1	XB2	XB3	XB4	XB5	XB6	XB7	XB8
11	L	20.625	5.000	4.000	6.000	6.000	4.000	15.625	17.002	8.501	3.501					
12	2 SAME AS CANTILEVER 1															

COLUMN DATA

CN	P	I	T	S	HT	A	DT	BT	DB	BB	DL	FLEX	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	SLOPE	EP	AP
21	1	C	T		50.000	0.000	10.000	6.000	10.000	6.000	6.000	0.000	10	6	11	10	6	11	28	16	11	28	16	11	0.000	0.000	0.000

FOOTING DATA

CN	S/P	B	D	T	DEL.B	DEL.D	DEL.T	R.B/D	R.D/B	S.HT.	NP	SYM.	BP	DP	SET.
31	P	12.000	12.000	3.000	0.500	0.500	0.250	1.000	1.000	2.500	4	3	0.000	0.000	0.000

GROUP II WIND

SUPERSTRUCTURE AREA* TRANS.	STD. LONG.	WIND ON SUPERSTRUCTURE INTENSITIES WIND	FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
1073.	2145.	1	50	0	44	6	41	12	33	16	17	19	7.375	7.375	6.475	18.124

GROUP III WIND

STD. * WIND	WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* STD. * WIND	WIND ON LIVE LOAD INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* LENGTHS OF LL TRANS.	LONGI.	* WIND ON LL ARMS APT	APL
1	50	0	44	6	41	12	33	16	17	19	1	100	0	88	12	82	24	66	32	34	38	110.0	220.0	15.583	15.583

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
0.000	7.940	15.583	15.583	0.00018000	0.00044000	0.000	0.000

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES

I.D.	NL	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
D.L.	0	229.188	269.528	0.000	269.528	0.000	269.528	229.188					
LL 1	1	75.625	41.285	0.000	0.000	0.000	0.000	0.000					
LL 2	2	75.625	96.295	0.000	61.899	0.000	0.000	0.000					
LL 3	3	75.625	96.295	0.000	99.726	0.000	75.652	3.431					
LL 4	1	0.000	0.000	0.000	0.000	0.000	41.284	75.625					
LL 5	2	0.000	0.000	0.000	61.899	0.000	96.295	75.625					
LL 6	3	3.431	75.652	0.000	99.726	0.000	96.295	75.625					
LL 7	1	0.000	20.628	0.000	75.652	0.000	20.628	0.000					
LL 8	2	30.936	96.281	0.000	85.973	0.000	20.628	0.000					
LL 9	3	30.936	96.281	0.000	96.295	0.000	96.281	30.936					
LL10	2	0.000	68.762	0.000	96.295	0.000	68.762	0.000					
LL11	2	75.625	41.285	0.000	0.000	0.000	41.285	75.625					
LL12	3	75.625	96.295	0.000	61.899	0.000	41.285	75.625					

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

LOAD	COL	TRANSVERSE PC	MT	V	MB	RF	ML	MR	* LONGITUDINAL MT	V	MB	MF
UNIT F.AT CL.CAP	1	0.000	-6.000	1.000	50.000	0.000	0.000	0.000	6.000	1.000	50.000	50.000
DEAD LOAD TOTAL	1	1507.710 1903.710	0.000	0.000	0.000	1903.710	7285.725	-7285.724	0.000	0.000	0.000	0.000
TRAC. FORCE 1 LN	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-171.369	-7.940	-520.729	-520.729
WIND ON SUBSTR.	1	0.000	-38.850	6.475	323.750	0.000	0.000	0.000	-108.744	-18.124	-906.200	-906.200
GROUP 2 WIND 1 1	1	0.000	-756.419	60.125	3401.919	0.000	0.000	0.000	-108.744	-18.124	-906.200	-906.200
GROUP 2 WIND 1 2	1	0.000	-756.419	60.125	3401.919	0.000	0.000	0.000	108.744	18.124	906.200	906.200
GROUP 2 WIND 2 1	1	0.000	-670.310	53.687	3032.538	0.000	0.000	0.000	-280.880	-30.994	-1644.616	-1644.616
GROUP 2 WIND 2 2	1	0.000	-670.310	53.687	3032.538	0.000	0.000	0.000	280.880	30.994	1644.616	1644.616

GROUP 2 WIND 3 1	1	0.000	-627.256	50.468	2847.848	0.000	0.000	0.000	-453.016	-43.864	-2383.032	-2383.032
GROUP 2 WIND 3 2	1	0.000	-627.256	50.468	2847.848	0.000	0.000	0.000	453.016	43.864	2383.032	2383.032
GROUP 2 WIND 4 1	1	0.000	-512.445	41.884	2355.341	0.000	0.000	0.000	-567.774	-52.444	-2875.310	-2875.310
GROUP 2 WIND 4 2	1	0.000	-512.445	41.884	2355.341	0.000	0.000	0.000	567.774	52.444	2875.310	2875.310
GROUP 2 WIND 5 1	1	0.000	-282.823	24.716	1370.327	0.000	0.000	0.000	-653.842	-58.879	-3244.518	-3244.518
GROUP 2 WIND 5 2	1	0.000	-282.823	24.716	1370.327	0.000	0.000	0.000	653.842	58.879	3244.518	3244.518
GROUP 3 WIND 1 1	1	0.000	-464.339	29.037	1741.989	0.000	0.000	0.000	-32.623	-5.437	-271.860	-271.860
GROUP 3 WIND 1 2	1	0.000	-464.339	29.037	1741.989	0.000	0.000	0.000	32.623	5.437	271.860	271.860
GROUP 3 WIND 2 1	1	0.000	-410.017	25.786	1544.605	0.000	0.000	0.000	-141.243	-11.938	-666.524	-666.524
GROUP 3 WIND 2 2	1	0.000	-410.017	25.786	1544.605	0.000	0.000	0.000	141.243	11.938	666.524	666.524
GROUP 3 WIND 3 1	1	0.000	-382.856	24.160	1445.913	0.000	0.000	0.000	-249.863	-18.439	-1061.188	-1061.188
GROUP 3 WIND 3 2	1	0.000	-382.856	24.160	1445.913	0.000	0.000	0.000	249.863	18.439	1061.188	1061.188
GROUP 3 WIND 4 1	1	0.000	-310.426	19.825	1182.735	0.000	0.000	0.000	-322.277	-22.773	-1324.297	-1324.297
GROUP 3 WIND 4 2	1	0.000	-310.426	19.825	1182.735	0.000	0.000	0.000	322.277	22.773	1324.297	1324.297
GROUP 3 WIND 5 1	1	0.000	-165.567	11.155	656.379	0.000	0.000	0.000	-376.587	-26.024	-1521.629	-1521.629
GROUP 3 WIND 5 2	1	0.000	-165.567	11.155	656.379	0.000	0.000	0.000	376.587	26.024	1521.629	1521.629
LIVE LOAD LL 1	1	116.910	-1636.740	0.000	1636.740	116.910	1636.740	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	233.819	-2104.380	0.000	2104.380	233.819	2104.380	0.000	0.000	0.000	0.000	0.000

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

		TRANSVERSE							*	LONGITUDINAL		
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
LIVE LOAD LL 3	1	315.656	-1262.636	0.000	1262.636	315.656	1893.942	-631.306	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	116.909	1636.731	0.000	-1636.731	116.909	0.000	-1636.731	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	233.819	2104.380	0.000	-2104.380	233.819	0.000	-2104.380	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	315.656	1262.635	0.000	-1262.635	315.656	631.306	-1893.942	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	116.908	0.000	0.000	0.000	116.908	175.359	-175.359	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	233.818	-1169.100	0.000	1169.100	233.818	1344.459	-175.359	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	315.656	0.000	0.000	0.000	315.656	1210.013	-1210.013	0.000	0.000	0.000	0.000
LIVE LOAD LL10	1	233.819	0.000	0.000	0.000	233.819	584.546	-584.546	0.000	0.000	0.000	0.000
LIVE LOAD LL11	1	233.820	0.000	0.000	0.000	233.820	1636.740	-1636.740	0.000	0.000	0.000	0.000
LIVE LOAD LL12	1	315.656	-420.876	0.000	420.876	315.656	1893.942	-1473.066	0.000	0.000	0.000	0.000

CAP ANALYSIS AND DESIGN DATA

CAP MOMENTS AND SHEARS

	MOMENTS(KIP-FEET)							**	SHEARS(KIPS)					
POINT	D.L.TOT.	G1 MAX.+	G1 MAX.-	G2 MAX.+	G2 MAX.-	G3 MAX.+	G3 MAX.-		DL T.LT	DL T.RT	G1 + LT	G1 + RT	G1 - LT	G1 - RT
P 1	-33.089	-33.089	-33.089	-33.089	-33.089	-33.089	-33.089		-18.921	-316.866	-18.921	-316.866	-18.921	-481.048
P 2	-2965.749	-2965.749	-4361.459	-2965.749	-2965.749	-2965.749	-3801.503		-376.698	-727.085	-376.698	-727.085	-540.880	-1100.323
P 3	-5564.350	-5564.350	-8266.768	-5564.350	-5564.350	-5564.350	-7182.564		-758.018	-758.018	-758.018	-758.018	-1131.257	-1131.257
C 1L	-9471.441	-9471.441	-14040.050	-9471.441	-9471.441	-9471.441	-12207.136		-804.818		-804.818		-1178.057	
C 1R	-9471.441	-9471.441	-14040.049	-9471.441	-9471.441	-9471.441	-12207.134			804.818		1178.057		804.818
P 5	-5564.350	-5564.350	-8266.767	-5564.350	-5564.350	-5564.350	-7182.563		758.018	758.018	1131.257	1131.257	758.018	758.018
P 6	-2965.749	-2965.749	-4361.459	-2965.749	-2965.749	-2965.749	-3801.503		727.085	376.698	1100.323	540.880	727.085	376.698
P 7	-33.089	-33.089	-33.090	-33.089	-33.089	-33.089	-33.090		316.866	18.921	481.048	18.921	316.866	18.921

CAP DESIGN DATA

PT.	M+ UNF. K-FT.	M- UNF. K-FT.	TOP REINFORCE. AS	NO.SIZE	BOT.REINFORCE. AS	NO.SIZE	LEFT STIRRUPS M.SP.	AV/IN	BAR&SPAC	RIGHT STIRRUPS M.SP.	AV/IN	BAR&SPAC	D IN.	FC PSI	PS %	FS/FF RATIO	FS/FZ RATIO
P 1	-25.453	-25.453	3.12	2 # 11	3.12	2 # 11	0.00	0.000	#5@ 0.00	24.00	0.060	#5@10.33	59.12		0.08	0.000	0.099
P 2	-2281.345	-2924.233	12.08	8 # 11	3.12	2 # 11	24.00	0.060	#5@10.33	24.00	0.121	#5@ 5.11	85.25		0.22	0.572	1.248
P 3	-4280.270	-5525.050	20.41	14 # 11	3.12	2 # 11	24.00	0.097	#5@ 6.37	24.00	0.097	#5@ 6.37	96.00		0.34	0.551	1.001
C 1	-7285.724	-9390.104	35.55	23 # 11	3.12	2 # 11	24.00	0.108	#5@ 5.72	24.00	0.108	#5@ 5.72	96.00		0.58	0.603	0.973
P 5	-4280.269	-5525.049	20.41	14 # 11	3.12	2 # 11	24.00	0.097	#5@ 6.37	24.00	0.097	#5@ 6.37	96.00		0.34	0.551	1.001
P 6	-2281.345	-2924.233	12.08	8 # 11	3.12	2 # 11	24.00	0.121	#5@ 5.11	24.00	0.060	#5@10.33	85.25		0.22	0.572	1.248
P 7	-25.453	-25.453	3.12	2 # 11	3.12	2 # 11	24.00	0.060	#5@10.33	0.00	0.000	#5@ 0.00	59.12		0.08	0.000	0.099

NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***

COLUMN ANALYSIS AND DESIGN OUTPUT

CRITICAL COLUMN LOADS

CN	T B	GR	LLC	WC	R	E S	C F	S F	PF	MTF	MLF	PM	MTM	MLM	PU	MTU	MLU	PU/PM	B	D
1	T	1	LL 2	0.0					2467.6	-4568.6	0.0	2467.6	4887.4	1777.5	11391.9	22574.6	8210.3	4.618	72.00	120.00
1	B	3	LL 9	5.1					2885.2	853.3	-3805.9	2885.2	3078.8	4536.7	9884.3	10549.4	15544.6	3.426	72.00	120.00

COLUMN DESIGN DATA

CN	T B	B FACE 1 NO.SIZE	B FACE 2 NO.SIZE	D FACE 3 NO.SIZE	D FACE 4 NO.SIZE	AS	PS	BD12	BD	SUMPU	SUMPC	DEL.T	DEL.L	CM	R	PHIC
1	T	16 # 11	16 # 11	12 # 11	12 # 11	87.36	1.011	1.00	0.000	2725.	41778.	1.070	1.201	1.000	2	0.70
1	B	16 # 11	16 # 11	12 # 11	12 # 11	87.36	1.011	1.00	0.000	2628.	41778.	1.067	1.192	1.000	2	0.70

FOOTING 1 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
1	3	LL 2	3.1				2096.503	3181.056	24.160	-2102.646	-34.319	162.564	72.316	203.343	293.590	90.785	0.000	26.569	MAX.P1
1	3	LL 2	1.1				2725.454	4520.270	37.749	-1707.313	-27.712	181.031	107.782	294.648	367.897	121.249	0.000	34.540	MAX.MT
1	3	LL 2	3.1				2725.454	4135.373	31.409	-2733.440	-44.615	211.333	94.011	264.345	381.667	118.021	0.000	34.540	MAX.VT
1	3	LL 3	4.1				2813.174	2890.975	25.773	-3549.345	-57.475	260.795	108.544	228.379	380.630	110.795	0.000	35.645	MAX.VP
1	3	LL 3	4.1				2813.174	2890.975	25.773	-3549.345	-57.475	260.795	108.544	228.379	380.630	238.909	53.501	35.645	MAX.ML
1	3	LL 3	4.1				2813.174	2890.975	25.773	-3549.345	-57.475	260.795	108.544	228.379	380.630	238.909	53.501	35.645	MAX.VL
1	2		3.1				1903.710	2847.849	50.468	-2383.032	-43.864	158.245	54.977	178.001	281.269	83.431	0.000	24.139	MAX.P3

FOOTING 1 ANALYSIS/DESIGN RESULTS

FOOTING SIZE			*	BAR REINFORCEMENT STEEL				*	SECTION CAPACITIES				*
B	D	T	P1/PA	AS	NO.SIZE	SPAC.	PLACEMENT	MT.	VB	VP	DS	FC
16.900	16.900	5.000	0.999	0.84	33 # 6 @	6.125	TOP TRAN	165.380	52.496	104.991	43.497	0.000
				1.22	21 # 9 @	9.625	BOT.LONG	242.635	53.629	107.258	44.436	0.000

NUMBER OF PILES = 13 BP = 3.600 DP = 3.600